AMENDMENT TO THE CLAIMS

1. (currently amended) A method of determining mass unbalance of an actuator mechanism in a system, the method comprising:

calculating a center of gravity of the actuator mechanism in first x (C_{X1}) and y (C_{Y1}) components ~~with respect to~~of a first coordinate system ~~of the actuator mechanism~~, wherein the first coordinate system intersects a pivot shaft of the actuator mechanism and has a y-axis in parallel with a longitudinal axis of the system and an x-axis normal to the y-axis;

calculating the center of gravity in second x (C_{X2}) and y (C_{Y2}) components ~~with respect to~~of a second coordinate system ~~of the actuator mechanism~~, wherein the second coordinate system intersects a pivot shaft of the actuator mechanism and has a y-axis in alignment with a longitudinal axis of a track accessing arm of the actuator mechanism and an x-axis normal to the y-axis; and

calculating a total mass unbalance of the actuator mechanism as a function of the first x (C_{X1}) and y (C_{Y1}) components and the second x (C_{X2}) and y (C_{Y2}) components.

2. (canceled).

3. (currently amended) The method of claim ~~2~~1, wherein calculating the center of gravity of the actuator mechanism in the first y component ~~in~~ of the first coordinate system comprises:

obtaining a first voice coil motor (VCM) current (I_{x+}) when the system is oriented in a first orientation; and

obtaining a second voice coil motor (VCM) current (I_{x-}) when the system is oriented in a second orientation.

4. (currently amended) The method of claim 3, wherein the first y component in the first coordinate system is calculated as a function of the first voice coil motor (VCM) current (I_{x+}), the second voice coil motor (VCM) current (I_{x-}), a torque constant (K_t) of the voice coil motor (VCM) and a mass (m) of the actuator mechanism.

5. (currently amended) The method of claim 2, wherein calculating the first x component in the first coordinate system comprises:

obtaining a third voice coil motor (VCM) current (I_{y+}) when the system is oriented in a third orientation; and

obtaining a fourth voice coil motor (VCM) current (I_{y-}) when the system is oriented in a fourth orientation.

6. (currently amended) The method of claim 5, wherein the first x component in the first coordinate system is calculated as a function of the third voice coil motor (VCM) current (I_{y+}), the fourth voice coil motor (VCM) current (I_{y-}), a torque constant (K_t) of the voice coil motor (VCM) and a mass (m) of the actuator mechanism.

7. (canceled).

8. (currently amended) The method of claim ~~7~~1, wherein calculating the ~~second~~ center of gravity of the actuator mechanism ~~with respect to~~in the second x and y components of the second coordinate system further comprises:

calculating a first angle between the ~~first~~ y-axis of the first coordinate system and a line that extends from the pivot shaft to a central axis of a storage media;

calculating a second angle between the ~~second~~ y-axis of the second coordinate system and the line that extends from the pivot shaft to the central axis of the storage media; and

calculating a third angle as a function of the first angle and the second angle.

9. (currently amended) The method of claim 8, wherein the second x and y components in the second coordinate system of the center of gravity are calculated as a function of the first x and y components in the first coordinate system of the center of gravity and the third angle.

10. (currently amended) The method of claim 9 and further comprising calculating ~~the~~ a total center of gravity of the actuator mechanism by taking the square root of the sum of the second x component squared and the second y component squared.

11. (currently amended) The method of claim 10, wherein the total mass unbalance of the actuator mechanism is calculated by multiplying the total center of gravity by the mass of the actuator mechanism.

12. (currently amended) A method of determining mass unbalance of an actuator mechanism, the method comprising:

obtaining a current drawn by the actuator mechanism from a voice coil motor to calculate a center of gravity of the actuator mechanism in first x (C_{X1}) and y (C_{Y1}) components of a first coordinate system; ~~and~~

calculating the center of gravity of the actuator mechanism in second x (C_{X2}) and y (C_{Y2}) components of a second coordinate system as a function of an angle (ϕ) between a track accessing arm of the actuator mechanism and a y-axis of the first coordinate system;

calculating the mass unbalance of the actuator mechanism as a function of ~~the current drawn by the actuator mechanism~~ the first x (C_{X1}) and y (C_{Y1}) components of the first coordinate system and the second x (C_{X2}) and y (C_{Y2}) components of the second coordinate system.

13. (canceled)

14. (currently amended) The method of claim ~~13~~12, wherein ~~calculating the center of gravity in the first y component with respect to~~obtaining the current drawn by the actuator mechanism from the voice coil motor to calculate the center of gravity of the actuator mechanism in the first y component of the first coordinate system comprises:

obtaining a first VCM current (I_{x+}) when the actuator mechanism is oriented in a first orientation;

obtaining a second VCM current (I_{x-}) when the actuator mechanism is oriented in a second orientation; and

calculating the first y component ~~in a first y axis~~ of the first coordinate system as a function of the first VCM current (I_{x+}) and the second VCM current (I_{x-}).

15. (currently amended) The method of claim ~~13~~12, wherein ~~calculating the center of gravity in the first x component with respect to~~ obtaining the current drawn by the actuator mechanism from the voice coil motor to calculate the center of gravity of the actuator mechanism in the first x component of the first coordinate system comprises:

obtaining a third VCM current (I_{y+}) when the actuator mechanism is oriented in a third orientation;

obtaining a fourth VCM current (I_{y-}) when the actuator mechanism is oriented in a fourth orientation;

calculating the first x component ~~in the first x axis~~ of the first coordinate system as a function of the third VCM current (I_{y+}) and the fourth VCM current (I_{y-}).

16. (currently amended) The method of claim ~~13~~12, wherein calculating the center of gravity in the second x and y components ~~with respect to~~of the second coordinate system comprises:

~~calculating a first angle between the first y axis and a line that extends from the pivot shaft to a central axis of a storage media~~;

~~calculating a second angle between the second y axis and the line that extends from the pivot shaft to the central axis of the storage media~~;

calculating ~~a~~ the ~~third~~ angle (ϕ) between the track accessing arm and the y-axis of the first coordinate system as a function of ~~the~~ an ~~first~~ angle (β) between the first y-axis and a line that extends from the pivot shaft to a central axis of a storage media and ~~the~~ an~~second~~ angle (α) between the second y-axis and the line that extends from the pivot shaft to the central axis of the storage media;

calculating the second y component as a function of the first x component of the first coordinate system, the first y component of the first coordinate system and the ~~third~~ angle (ϕ); and

calculating the second x component as a function of the first x component in the first coordinate system, the first y component in the first coordinate system and the ~~third~~ angle (ϕ).

17. (currently amended) The method of claim ~~16~~12, wherein calculating the ~~total~~ mass unbalance of the actuator mechanism comprises:

multiplying the mass of the actuator mechanism with the square root of the sum of the second x component squared and the second y component squared.

18. (currently amended) An apparatus comprising:

a voice coil motor configured to rotate the actuator mechanism about a pivot shaft, the actuator mechanism drawing a current from the voice coil motor; and

means for determining the mass unbalance of the actuator mechanism as a function of first x (C_{X1}) and y (C_{Y1}) components in a first coordinate system and second x (C_{X2}) and y (C_{Y2}) components in a second coordinate system~~s~~, wherein the first coordinate system intersects a pivot shaft of the actuator mechanism and has a y-axis in parallel with a longitudinal axis of the system and an x-axis normal to the y-axis and the second coordinate system intersects a pivot shaft of the actuator mechanism and has a y-axis in alignment with a longitudinal axis of a track accessing arm of the actuator mechanism and an x-axis normal to the y-axis.

19. (currently amended) The apparatus of claim 18, wherein the means for determining the mass unbalance of the actuator mechanism ~~is configured to calculate the mass unbalance by implementing the steps comprising~~comprises:

calculating a center of gravity of the actuator mechanism in first x (C_{X1}) and y (C_{Y1}) components ~~with respect to~~of ~~a~~ the first coordinate system ~~of an actuator mechanism~~;

calculating the center of gravity of the actuator mechanism in second x (C_{X2}) and y (C_{Y2}) components ~~with respect to a~~of the second coordinate system ~~of the actuator mechanism~~; and

calculating a total mass unbalance of the actuator mechanism as a function of the first x (C_{X1}) and y (C_{Y1}) components and the second x (C_{X2}) and y (C_{Y2}) components~~calculated first and second centers of gravity~~.

20. (currently amended) The apparatus of claim 19, wherein the means for determining the mass unbalance of the actuator mechanism ~~is configured to calculate the mass unbalance by implementing the steps comprising~~comprises:

multiplying the mass of the actuator mechanism with the square root of the sum of the second x component squared and the second y component squared.